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| APPLICATION NO.         | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-------------------------|-------------|----------------------|---------------------|------------------|
| 10/618,301              | 07/11/2003  | Masaki Hamamoto      | 59559 (70551)       | 4334             |
| 21874                   | 7590        | 03/21/2006           | EXAMINER            |                  |
| EDWARDS & ANGELL, LLP   |             |                      | HOLZEN, STEPHEN A   |                  |
| P.O. BOX 55874          |             |                      |                     |                  |
| BOSTON, MA 02205        |             |                      | ART UNIT            | PAPER NUMBER     |
|                         |             |                      | 3644                |                  |
| DATE MAILED: 03/21/2006 |             |                      |                     |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                               |                                 |  |
|------------------------------|-------------------------------|---------------------------------|--|
| <b>Office Action Summary</b> | Application No.<br>10/618,301 | Applicant(s)<br>HAMAMOTO ET AL. |  |
|                              | Examiner<br>Stephen A. Holzen | Art Unit<br>3644                |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 31-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 and 36-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The examiner has considered the IDS filed on 7/11/2003. The examiner mailed a copy of the considered statement with the last detailed action, and therefore an initialed copy will not be re-mailed, unless specifically requested by the applicant in response to this action.

### ***Response to Arguments***

2. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Shultz (3,167,129). Shultz teaches an airfoil for a helicopter. The airfoil is elastic and is comprised of two separate sheets joined to each other at a converging trailing edge and the joint is sufficiently rigid to transmit stress. The upper and lower aft skins are adhered by their forward margins, conforming to upper and lower airfoil contour faces on the spar. Airfoils so made may be symmetrical or unsymmetrical and may be

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substantially twisted along their spars. (See Col. 2, lines 10-15 and 50-55 and Col. 4, lines 30-35). It should be appreciated that the applicant's functional language in the claims does not serve to impart patentability. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. Apparatus claims cover what a device is, not what a device does. A claim containing a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior apparatus teaches all the structural limitation of the claims. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-2 (Fed. Cir. 1997); Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990); Ex parte Masham, 2 USPQ 2d 1647 (Bd. Pat. App. & Inter. 1987)

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 3, 8, 9, 14, 16-25, 36-39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Richard (6,824,094) in view of Arlton et al (5,879,131). Richard teaches an ornithopter having a power assembly which provides a flapping motion to the wings through a reciprocating shaft and through bell cranks. Richard further teaches

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an ornithopter that can hover above the ground and move laterally above the ground with the highest propulsive efficiency. A power assembly 16 (see FIGS. 1B and 2B) produces vertical and lateral movement of the wings. The vertical movement of the wings produces rotation of the hub 11 as a result of the orientation of the airfoils. The airfoils 17, 18, 19, and 20 of the wings each have a variable angle of attack and wing twist. The airfoils may be made of sustaining materials, such as foams, laminates or other light weight compositions; or they may be polymeric films or fabrics, such as Mylar (or Kevlar), mounted on spars 21, 22, 23, and 24 at the leading edges and booms 25, 26, 27, and 28 at the bases. The booms are rotatably mounted on the spars. The angle of the boom in relation to horizontal may be fixed or adjustable by flight controls. This angular relation develops the twist and angle of attack of the airfoils.

While the examiner does not believe that added limitation (starting with "wherein an angle of attack") rises to the level of a 112 2<sup>nd</sup> (indefinite) rejection, the examiner believes that this phrase merely limits the angle of attack to a smaller angle than is needed to generate similar lift with a fixed airfoil. The examiner asserts that Richard teaches this limitation. The fact that Richard is using a flapping motion to create lift in addition to the rotation lift producing motion implies an angle of attack that is smaller than the one needed for a similarly shaped fixed airfoil. Furthermore Richard teaches that the angle of attack can be varied depending on the type of desired motion. (See col. 3, lines 5-10).

Richard does not specifically disclose that his wing is elastically deformable however the examiner believes that Kevlar and Mylar (or other polymeric films used to

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make the airfoils) are capable of being elastically deformed. See for example where Richard teaches that "the airfoil may be shaped similar to sails by setting the tension on the airfoil by adjusting the" tension. Arlton et al teaches that it is well known to manufacture airfoils from an elastic material (see Col. 11, lines 40-43). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the wings/blades/airfoils from an elastic material for the purpose of decreasing the noise of the blades.

Re – Claim 3: Richard disclose a leading edge that is a boom, which is inherently stronger than the Kevlar/Mylar or other elastically formed trailing surface.

Re – Claim 8, 9: Richard inherently discloses these limitations. These limitations are generally taught by any reference (such as a helicopter) where the outer tip of the blade/airfoil moves substantially faster than the inner blade. Secondly it is well known that the outer tip of the helicopter blades/airfoils twist and flap. The craft of Richard inherently has similar properties.

Re – Claim 13: The feathering axis is inherently somewhere between the leading and trailing edges.

Re – Claim 14: It is the examiner's position that any wing capable of beating is capable of anticipating (rendering obvious) this limitation. Essentially the applicant is claiming that the beating wing creates, leaves, and moves back into the same vortex. The examiner asserts that during hovering mode (or slow lateral movement) the blades of Richard are capable of being used to contact a vortex that was generated by its own motion.

Re – Claims 15-25: Richard's device is capable of moving the wings upwardly and downwardly such that the different sections of the wings are capable of moving in different phases. It should be appreciated that the applicant's functional language in the claim does not serve to impart patentability. While features of an apparatus may be recited either structurally or functional, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. Apparatus claims cover what a device is, not what a device does. A claim containing a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior apparatus teaches all the structural limitation of the claims. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-2 (Fed. Cir. 1997); Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990); Ex parte Masham, 2 USPQ 2d 1647 (Bd. Pat. App. & Inter. 1987)

7. Claims 2, 4-7, and 10-12 rejected under 35 U.S.C. 103(a) as being unpatentable over Richard <sup>in view of Arlton</sup> as applied to claim 1 above, and further in view of Michelson (6,082,671). TL

While Richard teaches that it is known to use a variety of materials for the construction of the wings, Richard does not teach a wing having wave plate structure with upper and lower surfaces made from different material. Michelson however teaches that it is well known in the art to wave plate structure having alternative ridgelines and valley lines extending along the span direction of the wing span (see #17).

Re – Rigidity of Materials (claims 2, 4, 5, 10, 12): it would have been obvious to one having ordinary skill in the art at the time the invention was made to choose a material such that the upper material has greater torsional rigidity than a lower side since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In *re Leshin*, 125 USPQ 416. (The examiner asserts that rigidity is obvious and uses Shultz evidence to prove what is within ordinary skill. Shultz discloses that it is well known in the art to have different thicknesses of skin for the upper and lower skins, to have the fore-body thicker than the aft body (see Col. 6, lines 42-54). The examiner asserts that when one material is “thicker” than another material it is, in general, increasingly rigid.)

Re – Thickness (Shape) of Materials (claims 6, 7, 11): The court has held that the shape of the claimed device is design choice which a person of ordinary skill would have found obvious absent persuasive evidence that the particular shape of the claimed device was significant. (see *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)). (The examiner asserts that thicknesses are obvious and uses Shultz evidence to prove what is within ordinary skill. Shultz discloses that it is well known in the art to have different thicknesses of skin for the upper and lower skins, to have the fore-body thicker than the aft body (see Col. 6, lines 42-54).

The federal Circuit has held that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the



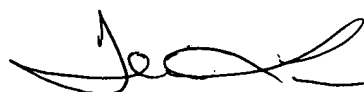
prior art device the claim device was not patentably distinct from the prior art device. (Gardner v. TEC Systems, Inc. 725 F.2d 1338, 220 USPQ 777 (Fed Cir. 1984), cert. denied 469 U.S. 830, 225 USPQ 232 (1984)).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen A. Holzen whose telephone number is 571-272-6903. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Teri Luu can be reached on 571-272-7045. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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